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SUMMIT COMMUNICATIONS, INC. SC

James A. Hirshfield, Jr.
President

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JUL 22 1994

FCC MAIL ROOM

July 21, 1994

Office of the Secretary
Federal Communications Commission
1919 "M" St., NW
Washington, DC 20554

RE: Comments of Summit Communications, Inc. Concerning the Fifth Notice of Proposed Rulemaking, Going Forward Rules, MM Docket No. 92-266.

Enclosed are an original and nine copies of our comments regarding the Fifth Notice of Proposed Rulemaking, Going Forward Rules described above.

If you should have any questions about the enclosed, please do not hesitate to call.

Very truly yours,

James A. Hirshfield
President

No. of Copies rec'd 0+9
List A B C D E

3633 136th Place S.E. Suite 107 Bellevue, WA 98006 206-747-4600

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554

In the Matter of	)	
	)	
Implementation of Sections	)	
of the Cable Television	)	
Consumer Protection and	)	MM Docket 92-266
Competition Act	)	
of 1992	)	
	)	
Rate Regulation	)	

To: The Commission

COMMENTS OF SUMMIT COMMUNICATIONS, INC. CONCERNING THE FIFTH NOTICE OF PROPOSED RULEMAKING, GOING FORWARD RULES

Date: July 12, 1994

1. Summit Communications, Inc. ("Summit") operates a number of small cable TV systems in the Pacific Northwest. Summit is particularly concerned with the economics of adding regulated channels under the going forward rules which the Commission is working to define. Summit believes that programming costs of channels added should be recoverable, as well as a revenue component over programming costs sufficient to provide economic incentive. We will not comment more specifically on these two items, as we generally agree with cable industry input you have received. Further, we are not commenting on a la carte rules. We are specifically concerned with the ability to recover equipment costs required to add regulated channels to small cable systems under the going forward rules.

2. For addition of regulated channels, recovery of programming costs plus a reasonable mark-up, as a going forward scheme, is not likely to allow recovery of capital investment for small cable TV systems, because this cost component looms larger as cable system size declines. Even a $0.xx per channel scheme, unless quite large, will not help small systems. Thus we recommend that the Commission add another component to its going forward rules for smaller cable systems, a component which allows recovery of capital expenditures made to add regulated channels.

3. A cable TV system, up and operating, with several satellite dishes installed at its head end, must still make specific expenditures for each channel added to the cable system. At a minimum, the following components are needed to add a satellite channel:

- Satellite receiver. This device functions as a tuner, much like the tuner in a TV set, to receive the satellite signal and bring it down to a common, lower frequency ("baseband"). This device performs a number of other signal processing functions as well. It tunes to a specific satellite transponder carrying the specific signal desired. Thus one of these devices is needed for each satellite channel received.

- Modulator. This is the device that takes the baseband signal from the satellite receiver, and places it (i.e., modulates it) on the cable channel frequency which will be used to deliver the signal over cable.

- Miscellaneous cables, fittings, splitters. Even with an existing satellite dish, feed horn, and low noise amplifier and block converter already installed outside, the incoming satellite feed must be split to allow a "port" to feed the new channel. This entails splitters, wires and fittings. If the satellite channel to be added comes from a satellite not presently received by the cable TV system, an entire new dish

or feed horn assembly (for multi-satellite dishes) must be installed. However, in our examples below we do not assume any expense outside the head end building.

- Decoder. Any scrambled satellite signal will require a decoder, which is placed between the satellite receiver and the modulator.

Some channel additions require other expenditures:

- FM processor. Some channels have heavy music or audio content, and ask the cable operator to also place their signal on the FM band, necessitating an additional piece of equipment.

- Stereo TV Encoder. Most operators adding channels prefer to use equipment which passes stereo audio from the satellite channel through to the cable system. These devices cost more than the entry-level receiver and modulator.

- Audio Level Control. These devices control the audio level of the modulated cable channel to ensure it maintains the appropriate relationship to video level and to other system channel audio levels. These devices are especially necessary on satellite services which package multiple inputs such as sports networks.

4. Exhibit A lists the various devices described above, and prices them out for a low cost and a high cost application - a conventional system and a phase-locked system. Total capital investment for a low-cost satellite channel application is $2,234. Total capital for a high-cost satellite channel application is $7,969. Attached as Exhibit B are product sheets which describe the pieces of equipment referred to in Exhibit A in more detail.

5. Exhibit C calculates average cost of providing the equipment for the low and the high examples presented in Exhibit A. No operating costs are included - just straight line depreciation over seven years.

6. Exhibit D takes the monthly capital cost recovery developed in Exhibit C and shows that recovery in cents per customer per month at various system sizes. Keep in mind that, by definition, these capital costs are per channel.

CONCLUSIONS

7. As shown on Exhibit D, the capital expenditure required in the head end to add each satellite channel to a cable TV system, at $0.03 to $0.10 per customer per month, becomes a significant item to 1,000 customer cable systems. At 500 customers the numbers are $0.05 and $0.19; at 200, $0.13 and $0.47. Clearly small systems face a difficult economic problem in adding signals to their service.

8. The dilemma presented could be resolved for small systems by allowing a simplified cost recovery of head end equipment required to add each channel, along the lines of those presented in Exhibits C and D.

9. In summary, in order to insure that the going forward rules allow small cable systems to add regulated channels without disadvantaging them severely vis a vis larger systems, the Commission should allow for capital recovery of the specific per channel required investment for cable TV systems under 1,000 customers.

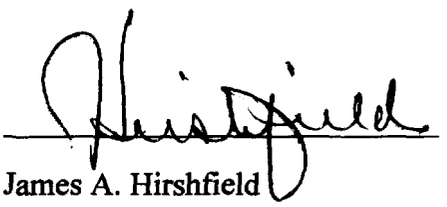
Summit Communications, Inc.

Date: 7-21-94

By: [signature]

CERTIFICATE

I, James A Hirshfield, hereby certify that the statements made in this Comments of Summit Communications, Inc. Concerning the Fifth Notice of Proposed Rulemaking are true and correct to the best of my knowledge, information and belief.



James A. Hirshfield

President

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EXHIBIT A

COST OF ADDING ONE SATELLITE CHANNEL

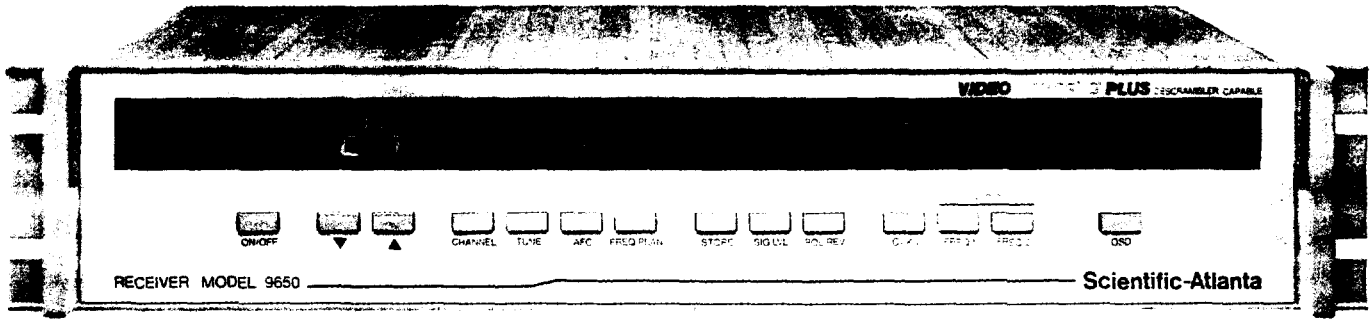
Item	Conventional System Low	Conventional System High	Phase Locked System Low	Phase Locked System High
Satellite Receiver	$ 800.00	1,500.00	800.00	1,500.00
Decoder	750.00	750.00	750.00	750.00
Modulator	500.00	1,850.00	2,500.00	3,300.00
Stereo Encoder		1,200.00		1,200.00
Audio Level control		600.00		600.00
Misc. cable, fittings, splitters and etc.	15.00	15.00	15.00	15.00
Sub total	$2,065.00	5,915.00	4,065.00	7,365.00
8.2% Tax	169.33	485.00	333.33	603.93
Total	$2,234.33	6,400.00	4,398.33	7,968.93

These cost estimates assume all Satellite receive antenna and down convertor systems outside the headend structure to exist prior to the channel addition.

Scientific Atlanta

Broadband Communications Group

Satellite Receiver *Series* **9640**



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Scientific-Atlanta's Model 9640 Satellite Receiver offers a wide range of operational features with superior reliability and video performance.

Features

- Two C-band and eight Ku-band pre-programmed formats
- User-programmed mode for creating channel-select formats specific to the individual user
- IF monitor port and AGC-to-Manual gain switch for C/N test
- Lock-out switch to secure front panel settings
- Compatible with all present descrambling technologies
- Direct digital readout for audio subcarrier frequency and bandwidth tuning
- Compact design fits all standard 19 inch wide racks

Description

The additional features included over its predecessor, the Model 9630 Satellite Receiver, make the Model 9640 Satellite Receiver very adaptable to system needs and transmission formats yet simple to operate. This satellite receiver is well suited for CATV systems, hotels/motels, apartment and condominium complexes, hospitals, and private corporate networks.

C-Band/Ku-Band Compatible

The Model 9640 Satellite Receiver offers a variety of pre-programmed C-band and Ku-band formats plus a user programmed mode for nonstandard C-band or Ku-band channels. Channel selection for both C-band and Ku-band can be remotely controlled using a new BCD programmed interface at the rear panel. An indicator light at the front panel shows that the "remote" interface is in operation.

Satellite Receiver
Series 9640

Tuning and Operating Features

The Model 9640 Satellite Receiver has ten pre-programmed frequency plans to select from (including the most common Ku-band formats). A user-programmed mode is also available for complete flexibility in tuning. The satellite receiver allows convenient access for measuring overall earth station performance. An IF monitor port and AGC-to-Manual gain switch allow C/N test to be easily performed. Video clamp and de-emphasis are rear panel switchable and a second video port is available for monitoring without interrupting the program feed.

Security and Scrambling

For security, the Model 9640 Satellite Receiver offers a lock-out switch to secure operational settings. This satellite receiver is also compatible with all present descrambling technologies by means of a video clamp bypass and video invert switch on the video output and de-emphasis disable on the composite output. The Model 9640 Satellite Receiver offers a perfect match to the Scientific-Atlanta B-MAC encryption system for secure networks (including a front panel indication when a valid B-MAC signal is being received).

Operating Data

Operating at an input frequency of 950 MHz to 1450 MHz or 1000 MHz to 1500 MHz, the block conversion receiver has frequency synthesized tuning, AFC, rear panel IF loop, and single or dual LNB operation. A choice of IF filters is available along with automatic polarity switching and a polarization reverse switch located on the front panel for added convenience. For single polarization feeds a front panel control operates a transistor switch that may be used to switch polarization at the antenna.

Expanded Audio Features

Audio features on the Model 9640 Satellite Receiver include a direct digital readout for audio subcarrier frequency and an LED display indicating bandwidth selection. Independent frequency-synthesized audio tuning is standard as well as both wide and narrow audio filters. The front panel displays the standard or optional second audio channel information.

Compact Design

The compact design is achieved through use of a microprocessor to control all receiver functions and high technology surface-mount devices to minimize circuit board area. At 19 inches wide and 3.5 inches in height, the satellite receiver fits compactly in all standard racks.

Low Noise Block (LNB) Downconverters

The Model 9640 Satellite Receiver is designed for use with Scientific-Atlanta's Model 9321 LNB (for C-band signal conversion) and Model 367 LNB (for Ku-band signal conversion) downconverters. In addition, this satellite receiver can be used with downconverters which use a 1000 MHz to 1500 MHz IF frequency.

Model 9321 LNB

The Model 9321 LNB downconverter is used for C-band signal conversion. The Model 9321 LNB accepts an input of 3.7 GHz to 4.2 GHz, then amplifies and block converts the input band to the 950 MHz to 1450 MHz operating range of the receiver.

Model 367 LNB

The Model 367 LNB downconverter is used for Ku-band signal conversion. The Model 367 LNB accepts an input of 11.7 GHz to 12.2 GHz, then amplifies and block converts the input band to the 950 MHz to 1450 MHz operating range of the receiver.

Model 9325 Block Converter

The Model 9325 Block Converter is a stand-alone device which accepts an input of 3.7 GHz to 4.2 GHz from a standard TVRO LNA and converts the block of signals to an output frequency band of 950 MHz to 1450 MHz. It can be used to add 950 MHz to 1450 MHz receivers to an existing LNA system and any other systems where a separate LNA is required. The Model 9325 Block Converter stops dc from passing through toward the LNA.

Specifications

RF Input

Input level
-70 dBm to -30 dBm (per carrier, 12 carriers)
Frequency
950 MHz to 1450 MHz, or 1000 MHz to 1500 MHz
Synthesizer step size
100 kHz
AFC capture range
±6 MHz
Impedance
75 Ω
Return loss at HV switch input
>10 dB (950 MHz to 1450 MHz)
Noise figure at HV switch input
14 dB, max
Image rejection
30 dB, min

IF

Frequency
510 MHz
Bandwidth
28 MHz, 22 MHz and 32 MHz optional
IF monitor impedance
75 Ω
AGC dynamic range
40 dB

Video

De-emphasis 525-line (defeatable)
CCIR Rec. 405-1
Output level
1 V p-p, adjustable ±3 dB
Frequency response
±1.0 dB (30 Hz to 2.0 MHz)
±2.0 dB (2.0 MHz to 4.2 MHz)
Polarity
Switchable, normal/inverted
Clamping (defeatable)
30 dB dispersal rejection
Line-time waveform distortion
<2% tilt
Field-time waveform distortion
<2% tilt
Differential phase
<5 degrees, 10% to 90% APL
Differential gain
<5 degrees, 10% to 90% APL

Audio

Audio 1
Tuneable 5.0 MHz to 8.5 MHz
Audio 2 (optional)
Tuneable 5.0 MHz to 8.5 MHz
Frequency response
40 Hz to 15 kHz, ±1.0 dB
Wide audio filter
Bandwidth 400 kHz
Narrow audio filter
Bandwidth 280 kHz
De-emphasis
75 µs
Impedance
<600 Ω, capable of driving 600 Ω balanced load
Harmonic distortion
<1.5%

Power Requirements

115 V ac, ±10%, 60 Hz
<35 W (while LNB is powered)

Remote Control Requirements

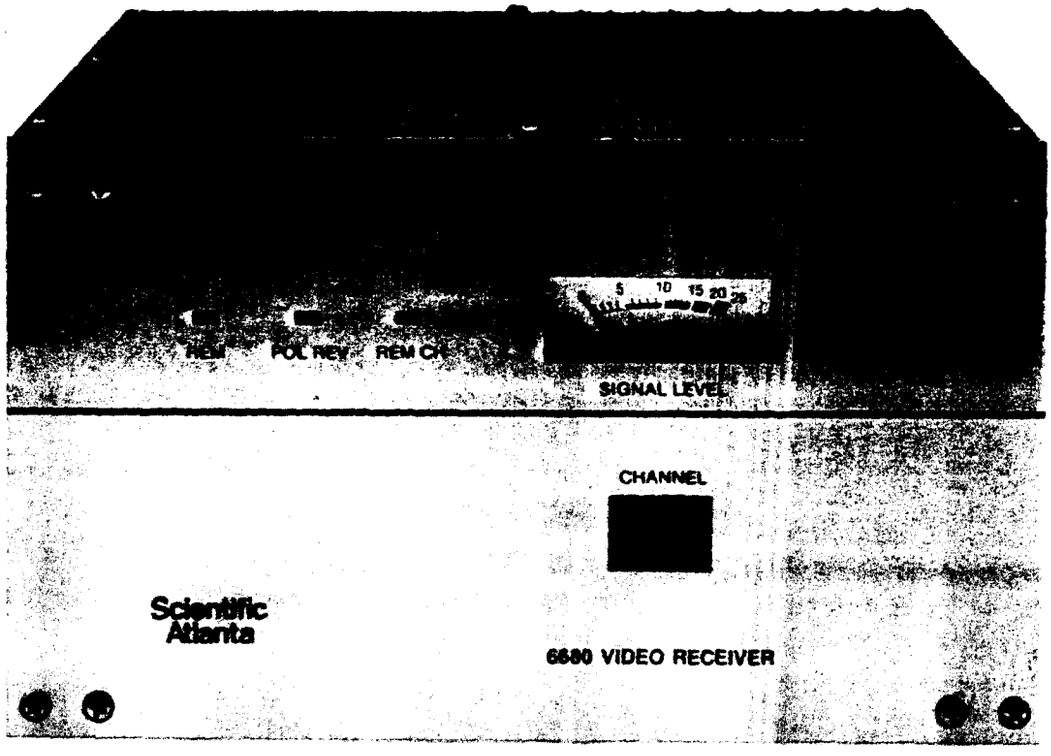
BCD parallel line input
TTL compatible

Dimensions

3.5 in. H x 19.0 in. W x 15.0 in. D
(8.89 cm H x 48.26 cm W x 38.10 cm D)

$1500.00

Model 6680 Video Receiver



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Description

The Model 6680 Video Receiver performs at the highest level of quality for video, audio and data reception. The Model 6680 Video Receiver represents the second generation of the field-proven Series 6650 Receiver. New features and design concepts include an improved RF converter for lower input return loss and phase noise. The new video demodulator is designed for increased performance in the presence of today's multiple subcarrier transmissions. A tunable audio subcarrier demodulator has been added to the receiver to provide immediate retuning to any desired subcarrier service.

Block Downconversion for Lower System Cost

The Model 6680 Video Receiver is designed for use with Scientific-Atlanta's Series 9360 Low Noise Block Downconverter (LNB). The downconversion of the 500 MHz satellite band to UHF from 270 MHz to 770 MHz is consistent with the Model 6650 Receiver. This conversion at the antenna feed eliminates the need for expensive microwave components in the receiver, thereby reducing overall system cost. In addition, low-cost coaxial cable can be used for the connection between antenna and headend.

Added Convenience and Features

The rear panel of the Model 6680 Video Receiver features an IF loop to facilitate the addition of terrestrial filters, an optional second video output port, and a polarization control switch to allow three alternatives for operation of the internal coax switch. Designed and engineered for operating flexibility, the Model 6680 Video Receiver's interior modular construction accepts plug-in cards for a variety of system applications, including additional satellite transmission formats. The exterior design approach is also conveniently modular. Two 8 1/2-inch wide Model 6680 Video Receivers easily fit side-by-side in a 19-inch CATV headend rack adapter.

Features

Electrical

- RF Converter — Same frequency plan as the Model 6650 Receiver, 270 MHz to 770 MHz input band
- Video Demodulator — Improved design, limiter-discriminator circuitry, improved video in multiple subcarrier environments and accurate demodulation of data transmissions
- Audio Demodulator — Tuneable audio circuit (5.5 MHz to 8 MHz) with frequency adjust through top cover
- Remote Control — Remote circuitry built into each receiver with TTL compatibility for a BCD coded interface
- Polarization Switch — Back panel switch to either reverse polarity or hold receiver input on vertical port through all 24 channels
- UL Listing

Options

- Second tunable program/subcarrier demodulator
- Rack adapter
- IF filter card: 18 MHz, 25 MHz, 36 MHz (30 MHz standard)
- 220/230/240 V ac, 50 Hz power supply
- Second video output

Model 6680 Video Receiver

Specifications

RF Input

RF input
-35 dBm max
Frequency
270 MHz to 770 MHz
Impedance
75 Ω
Return loss
≥14 dB
Noise figure
12 dB max
Image rejection
>45 dB

IF

Intermediate frequency
230 MHz
Effective noise bandwidth
32.0 MHz
Impedance
75 Ω
Return loss at IF monitor port and loop-through ports
≥15 dB
Dynamic operating range
40 dB

Baseband
De-emphasis 525-line
CCIR Rec. 405-1

Video

Video level
1 V p-p ±3 dB adjustable
Response (15 Hz to 4.2 MHz)
±1.0 dB
Impedance
75 Ω, unbalanced
Return loss at output port
≥26 dB
Polarity
Black-to-white
Positive going
Clamping
30 dB dispersal rejection (defeatable)
Line-time waveform distortion
<1% tilt
Field-time waveform distortion
<1% tilt
Differential phase
<±1.5°, 10% to 90% APL
Differential gain
<±3%, 10% to 90% APL
FM video static threshold
≤8 dB C/N

Audio

Subcarrier frequency
5.5 MHz to 8 MHz tuneable
Pre-detection bandwidth
150 kHz, 280 kHz, 400 kHz (switch selectable)
Frequency response
30 Hz to 15 kHz ±1.0 dB
De-emphasis
75 µs, 50 µs, J17 (selectable)
Output level
Continuously variable, -10 dBm to +10 dBm
Impedance
600 Ω, balanced
Harmonic distortion
≤1% typically 0.5%

Controls/Interface

Rear panel
Power ON/OFF
110 V ac 3/4 A line fuse
RF inputs, horizontal and vertical
IF loop IN and OUT
Composite baseband OUT
Video out
Audio outputs (2)
Polarization reversal switch
+18 V dc @ 400 mA (LNB power)
Power insertion terminals
Remote control connector
IF monitor port
AGC monitor terminal
Front panel
Signal strength meter
Local frequency switch 24 channels
Remote programming indicator
Remote frequency selected indicator
Power ON indication (back light on meter)
Top panel
Video level adjust
1 V p-p ±3 dB
Audio level adjust
-10 dBm to +10 dBm
Threshold centering adjustment
AGC/MGC selection switch
Manual gain control
Zero-on-noise meter adjustment
Tuneable audio frequency control
Audio pre-detection bandwidth

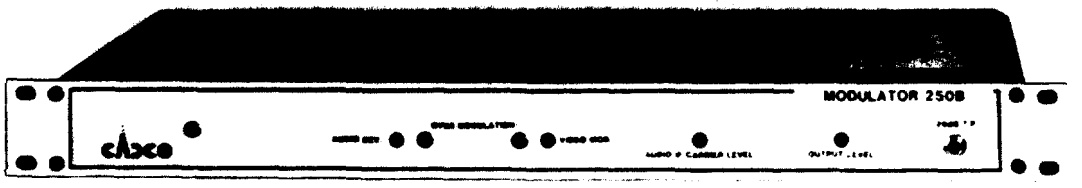
General

Operating temperature
0°C to +50°C (32°F to 122°F)
Mechanical
133.4 mm H x 209.8 mm W x 344.4 mm D
(5.25 in. H x 8.26 in. W x 13.56 in. D)
Weight
Net 24.4 kg (11 lbs)
Shipping 30.8 kg (14 lbs)
Power requirements
75 watts max, 103.5 V ac to 126.5 V ac, 60 Hz

Specifications subject to change without notice.

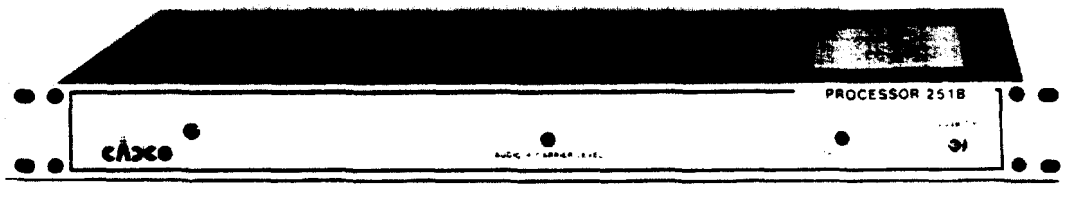
MODULATOR 250B

$500



4.5 MHz Stereo and Baseband Audio Inputs

PROCESSOR 251B



INTERNATIONAL MODELS AVAILABLE!

SPECIFICATIONS

MODULATOR 250B

PARAMETER	SYSTEM M/N	SYSTEM B/G	SYSTEM D/K China*	SYSTEM I
VIDEO SECTION				
Input: C3F Neg	NTSC	PAL	PAL	PAL
Input Impedance	75 ohms unbalanced	75 ohms unbalanced	75 ohms unbalanced	75 ohms unbalanced
Frequency Response	±0.5 dB	±0.5 dB	±0.5 dB	±0.5 dB
Bandwidth	4.2 MHz	5.0 MHz	5.0 MHz	5.5 MHz
Differential Gain	5% max	5% max	5% max	5% max
Differential Phase	5 degree max	5 degree max	5 degree max	5 degree max
Hum & Noise	-60 dB	-60 dB	-60 dB	-60 dB
AUDIO SECTION				
Input: 50 Hz-15 KHz	0 dBm (.8V)	0 dBm (.8V)	0 dBm (.8V)	0 dBm (.8V)
Impedance	600 ohms balanced	600 ohms balanced	600 ohms balanced	600 ohms balanced
Frequency Response	±1.0 dB	±1.0 dB	±1.0 dB	±1.0 dB
Frequency Tolerance, ±500 Hz	4.5 MHz	5.5 MHz	6.5 MHz	6.0 MHz
Frequency Deviation	±25 KHz	±50 KHz	±50 KHz	±50 KHz
Harmonic Distortion	1% max	1% max	1% max	1% max
Preemphasis	75µs	50µs	50µs	50µs
IF SECTION				
Video IF Level	+37 dBmV +97 dBµV	+37 dBmV +97 dBµV	+37 dBmV +97 dBµV	+37 dBmV +97 dBµV
Audio IF Level	+22 dBmV +82 dBµV	+27 dBmV +87 dBµV	+27 dBmV +87 dBµV	+27 dBmV +87 dBµV
Return Loss	>14 dB	>14 dB	>14 dB	>14 dB
IF Frequency				
Video Carrier	45.75 MHz	38.9 MHz	38.0 MHz	38.9 MHz
Audio Carrier	41.25 MHz	33.4 MHz	31.5 MHz	32.9 MHz
Video-Sound Spacing	+4.5 MHz	+5.5 MHz	+6.5 MHz	+6.0 MHz
Vestigial Sideband Width	0.75 MHz	0.75 MHz	0.75 MHz	1.25 MHz
RF SECTION				
Output Frequency	7-550 MHz	47-550 MHz	44-550 MHz	48-550 MHz
Frequency Tolerance	±3 KHz	±3 KHz	±3 KHz	±3 KHz
Output Level	+60 dBmV max	+60 dBmV max	+60 dBmV max	+60 dBmV max
adjustable	+120 dBµV	+120 dBµV	+120 dBµV	+120 dBµV
Output Impedance	75 ohms unbalanced	75 ohms unbalanced	75 ohms unbalanced	75 ohms unbalanced
Spurious Output 5-552 MHz @+60 dBmV/+120 dBµV Output Level	<-60 dBc	<-60 dBc	<-60 dBc	<-60 dBc
Return Loss	>14 dB	>14 dB	>14 dB	>14 dB
Frequency Response	<2 dB	<2 dB	<2 dB	<2 dB

MECHANICAL AND POWER

Dimensions	Standard 19" (48.26 cm) Rack Mount, 1.75" (4.44 cm) High & 14" (35.56 cm) Deep
Weight	8 Pounds (3.6 kg)
Power	115/240 VAC 50/60 Hz 30 Watts
Operating Temperature	40° F to 110° F
NOTE	1. We recommend 1.75" (4.44 cm) spacing between units racked in an open rack. 2. If mounted in an enclosed cabinet, air flow is recommended.

* Acceptance Tested by the China Ministry of Radio, Television and Film.

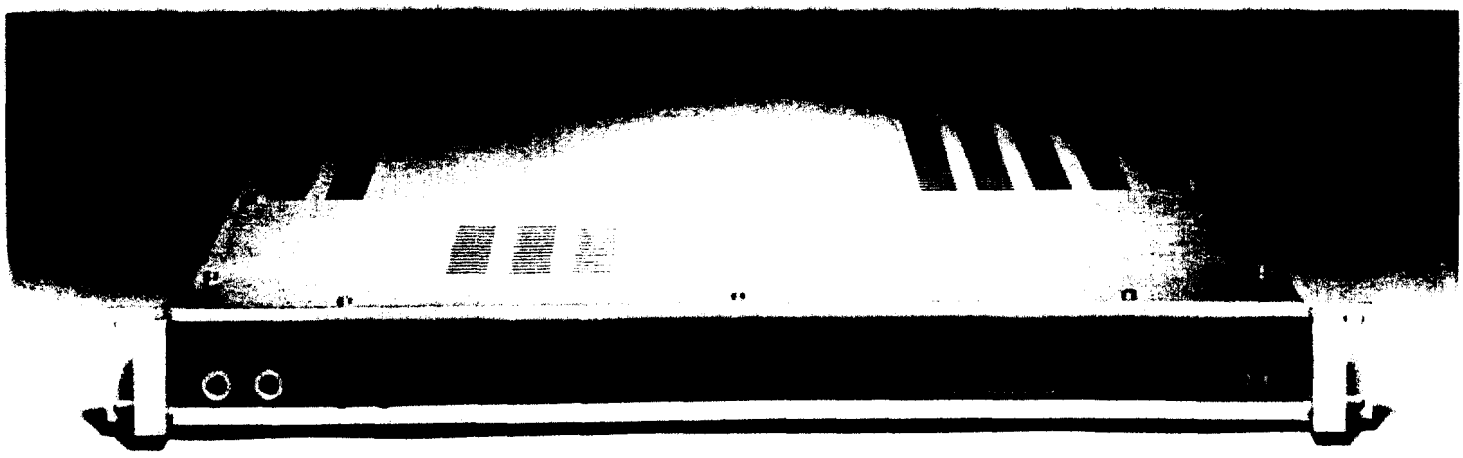
EXHIBIT B

CADCO 2405 S. Shiloh Rd. • Garland, Texas, 75041 • 800 877 2286 • 214 271 3651 • FAX 214 271 3654

Jerrold COMMANDER 6®
C6M

$1850.00

Frequency Agile →Modulator



FEATURES

- **FREQUENCY AGILE FROM 50 TO 600 MHz**
- **FRONT PANEL CONTROLS**
- **IF AND BASEBAND SWITCHING FUNCTIONS**
- **BTSC STEREO COMPATIBLE**
- **CONTINUOUS VIDEO DEPTH OF MODULATION DISPLAY**
- **CONTINUOUS AUDIO FREQUENCY DEVIATION DISPLAY**
- **1.75 INCHES HIGH**

Commander 6 Modulators are state-of-the-art, frequency agile units capable of satisfying the most demanding CATV applications.

Models C6M and C6MP operate on HRC or IRC channel assignments between 50 and 600 MHz. The system is packaged in a space saving 1.75 inch rack-mounted housing and utilizes efficient switching power supply regulators to minimize heat and power consumption.

FRONT PANEL CONTROLS

The C6 utilizes a front panel switch to select all standard, HRC and IRC channel assignments between 50 and 600 MHz.

Internal bandpass filters are automatically engaged upon frequency selection, ensuring that a weighted signal-to-noise ratio of greater than 60 dB is maintained with no external filtering required, regardless of the number of units combined.

Front Panel Bar Graphs indicate video depth of modulation and audio deviation allowing for quick visual status checks.

In addition, the front panel includes RF and IF test points, and indicators for phaselock status, video input and IF switching status. Digital channel select switches, and picture and sound carrier output level controls are also included on the front panel.

AUTOMATIC SIGNAL SWITCHING

A switched IF input is provided which can be controlled externally or automatically on loss of video input. Additional levels of switching are offered with the options package, Module C6 MOB.

The IF to channel output converter system is frequency agile from 50 to 600 MHz. The aeronautical band frequency accuracy requirement is met and the FCC required frequency offsets of +12.5 KHz and +25 KHz are generated automatically. The RF channel output is available at a full 60 dBmV level with low spurious and high carrier-to-noise ratio.

SCRAMBLING COMPATIBILITY

The C6M and C6MP are compatible with commercial scrambling systems. The C6 Modulator is compatible with the Jerrold Scrambler, Model MVP, in all scrambling modes. The C6 offers a composite IF input connection to facilitate scrambling with the MVP.

STEREO COMPATIBLE

The C6 Modulators are easily interfaced with Jerrold's CMTS, stereo encoder. Stereo encoder interfacing can be done with 41.25 MHz or 4.5 MHz sound carrier inputs. Maximum consideration was given to simplifying the required interconnect wiring.

HRC - IRC SWITCHABLE

The output of model C6MP can be set for either harmonic or incremental related carrier (HRC or IRC) operation. The C6 phaselock modulator is connected to a phaselock reference generator, such as Jerrold's CCG-* family, via a convenient built-in loop-through input. When the external reference signal is unavailable, carrier frequency is maintained by a precise internal reference.

OPTION PACKAGE, MODULE C6 MOB

A single options module, model C6 MOB allows the user to conveniently add baseband audio and video input switching, a 4.5 MHz sound carrier input and an additional switched IF input. These inputs are externally selectable and can be programmed for automatic switching upon loss of video input. The options module also includes defeatable video and audio AGC for applications involving variable baseband signal levels.

EXHIBIT B

General Instrument

AUDIO/VIDEO AGC

When the option board is installed, separate audio and video automatic gain control operation is available. Preset modulation levels are maintained despite changes in audio/video input levels resulting from varying signal levels or when switching between audio/video sources.

BASEBAND INPUT SWITCHING

A video switching facility is provided. The associated relay, and the Audio A or Audio B Input selection is controlled by the circuitry in the video switch section. The video switch system includes video A signal sensing to allow automatic switching to video B input when the video signal is absent. A rear panel connection provides for external control as well. Audio Input switching follows the video input selection automatically.

SECOND IF SWITCH

The option board offers an additional IF signal input called PROGRAM. This is identical to AUX IF switching except that it has a lower priority. The PRGM IF switch is used for program switching or automatic program replacement when the AUX IF switch is used for the emergency alert function.

4.5 MHz AUDIO INPUT

When installed, the option board provides an external 4.5 MHz input and a facility to switch between that input and the internally generated sound signal. The 4.5 MHz input provides for simple audio interfacing to the output of a stereo encoder or demodulator.

WIDE VARIETY OF BENEFITS

Jerrold's Commander® 6 Modulator offers versatility and ease of maintenance to all existing and new cable headends. The frequency agility and phaselocked frequency synthesis are designed for universal application and to reduce inventory needed for a multichannel system.

The Commander 6 Modulator is compatible, with all present and past Jerrold Headend equipment, and provides all the features you've come to expect from Commander products.

Specifications

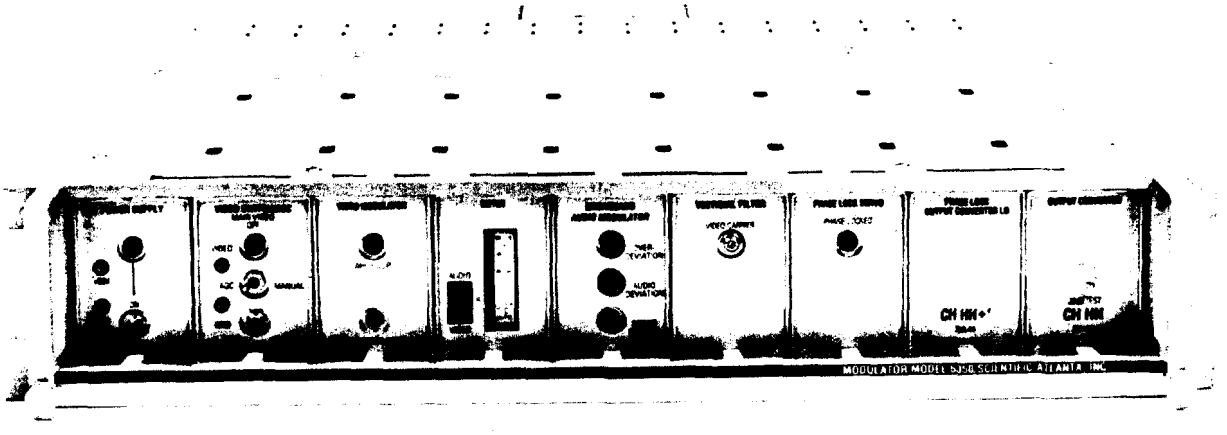
RF		
Frequency Range	Channels 2 to 94 50 to 600 MHz (HRC, IRC, Standard)	
Frequency Accuracy	±5 KHz	
Output Level	60 dBmV min.	
Spurious	−60 dBc max.	
Output Impedance	75 Ohms	
Output Return Loss	14 dB minimum within the output channel	
Sound Carrier Level	Adjustable from −5 to −25 dB relative to picture carrier	
C/N Ratio	Typical	Minimum
In-band	70 dB	67 dB
Adjacent channel	74 dB	70 dB
Wideband	78 dB	75 dB
IF		
Picture IF Output Frequency	45.75 MHz	
Picture IF Output Level	35 dBmV nominal	
Sound IF Output Frequency	41.25 MHz	
Sound IF Output Level	10 to 30 dBmV	
CW IF Output Frequency	45.75 MHz	
CW IF Output Level	5 dBm ±5.0 dB	
GENERAL		
Power Requirements	30-35 Watts	
Weight	12.8 lbs	
Dimensions	19"Wx1.75"Hx17"D	

VIDEO	
Standard Baseband Input level range	0.5 to 2.0 V P-P for 87.5% modulation
Encoded Video Input Level	1.75 V P-P nominal for 87.5%
Video Input Impedance	75 Ohms
Video Input Return Loss	30 dB min.
K Factor	2% max. with 2T pulse
S/N Ratio (Lum weighted)	64 dB min. per NTC-7, 3.16
Chroma Delay, relative to std. precorrection	
15 to 25° C	±50 nSec
0 to 50° C	±65 nSec
Frequency Response	±0.5 dB maximum from 25 Hz to 4.1 MHz
Differential Gain	±0.25 at 87.5% mod.
Differential Phase	±0.5 degrees max.
Hum and Noise	−60 dB at 87.5% mod.
Tilt	1.0% maximum per NTC-7, 3.3
AUDIO	
Input Level Range	Dual input range selectable
Range 1	−10 to +10 dBm
Range 2	+5 to +25 dBm
Input Impedance	Dual input range selectable
Low Impedance	600 Ohms balanced
High Impedance	Greater than 10 kohms
Frequency Response	±1.0 dB maximum from 30 Hz to 15 KHz
Harmonic Distortion	1.0% maximum from 30 Hz to 15 KHz at ±25 KHz dev.
FM hum and noise	−60 dB maximum with respect to ±25 KHz deviation
Intercarrier Frequency	4.5 MHz ±500 Hz

Specifications subject to change without notice.

In U.S.: Hatboro, PA 19040 (215) 674-4800. In Canada: Toronto, Ont. (416) 789-7831. In Europe: Reading, England 44-734-755555. In Hong Kong: 852-587-1163. In Brazil: 55-21-494-3132. In Argentina: 541-788-4567.

Model 6350 Television Modulator ← $ 3300



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Description

The Model 6350 Television Modulator generates a high-quality vestigial sideband TV signal. Advanced circuit design results in unexcelled picture and sound fidelity from color or black and white video inputs and from either baseband audio or 4.5 MHz subcarrier inputs. Scientific-Atlanta's pioneering application of the Surface Acoustic Wave (SAW) filter results in unequalled vestigial sideband response characteristics. The SAW filter provides superior adjacent channel performance while retaining excellent group delay characteristics. Vestigial sideband filter adjustments are virtually eliminated and temperature stability is excellent.

A delay predistortion network is provided to conform with the standard FCC predistortion requirements.

Most of the modulator circuits, including power supply are contained in solid-state plug-in modules, easily accessible from the front panel. Some of the modules are interchangeable with those of the Model 6150 Signal Processor and Model 6250 Television Demodulator, thereby reducing spares inventory requirements.

Features

- All solid-state
- SAW filter technology
- Low power consumption
- Covers all standard and nonstandard television channels
- Many options available
- Monitor/test connector
- Frequency Agile Output Capabilities
- BTSC stereo encoder plug-in capability
- FCC offsets and stability

Modulator Options

Frequency Agile Output Converter—Option FAOC allows the addition of agility while retaining the benefits of modularity. The FAOC is capable of tuning to all EIA channels from 50 MHz to 550 MHz.

Agile Phase Lock Reference Module—Option PLAC allows the FAOC RF output to be phase locked to an IRC or HRC comb generator.

Integrated Stereo Encoder—Option ISE provides a plug-in module for easy addition of BTSC Stereo. The encoder interfaces directly to the IF circuits of the modulator. This allows carrier deviation to be factory calibrated and simplifies setup.

Phase Lock—Option PL permits phase-locking the modulator output to an interfering local off-air station, resulting in significantly reduced or eliminated interference. A reference video output is furnished for gen-locking to eliminate the moving sync bar. Phase lock option may also be used to lock a modulator in a coherent headend system to a master reference (HRC and IRC headends). For use with fixed channel output sets.

Video Switching—Option VSAGC allows automatic switchover to a secondary video source when primary video is lost. This can be manually switched by an external contact closure. Provides a switching voltage for the companion audio switch option, for audio-follow-video operation. An AGC circuit provides a constant output level of 1 V p-p with input level variations of 0.5 V to 2 V p-p. Sync amplitude is continually monitored so picture level will not affect AGC action.

Audio Switching—Option AS permits switchover to an alternate audio source. Control can be manual or automatic from option VSAGC. Option AS is not necessary when one or both inputs are accompanied by a 4.5 MHz audio subcarrier. An additional switch input is provided to permit switching emergency override audio. The alternate audio may be stereo.

Audio Modulation Limiter—Option AML limits sound deviations to 25 kHz on all audio inputs. There are no detectable thumping or pumping effects. (This option cannot be used with BTSC stereo signals.)

High-level IF Switching—An alternate high-level IF signal can be switched into the modulator output converter with Option HIFS. Composite IF is interrupted just before upconversion. With option VSAGC installed, switching can be actuated automatically upon loss of video. Switch control can also be manual by an external contact closure.

Audio Subcarrier Loop-through—Option ASL provides separate paths for video and 4.5 MHz subcarrier audio. Provides optimum performance when injecting 4.5 MHz BTSC stereo.

IF Automatic Gain Control—With IFAGC installed, amplification and automatic gain control of an external High Level IF input is provided. This option is used with the HIFS option.

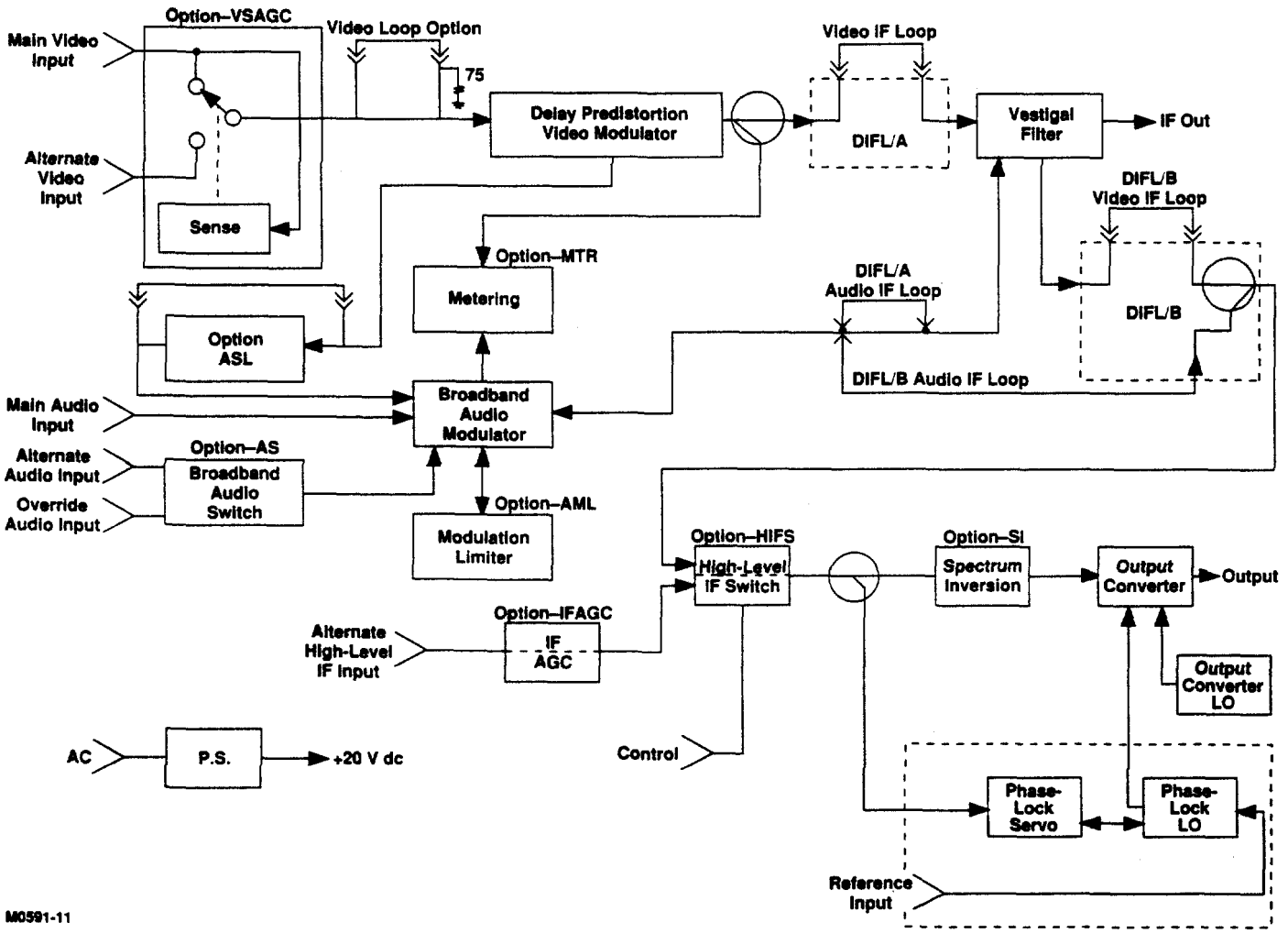
IF Loop-through—Option SIFL furnishes a composite IF output signal for processing by a scrambler. The scrambled composite IF signal is then returned to the output converter.

DIFLA—Option DIFLA furnishes separate audio and video IF signals prior to the vestigial sideband filter for use with pulse-sync suppression scrambler systems.

DIFLB—Option DIFLB provides separate audio and video IF signals after the vestigial sideband filter for use with sinewave suppressed scrambler systems.

Spectrum Inversion—Option SI inverts the video and audio carriers, with the video carrier 4.5 MHz above the audio at rf. The signal is contained within the normal channel allocation.

Signal, Voltage Metering—Option MTR installs a metering module in the front panel of the modulator. A switch-selectable meter displays audio deviation, video modulation depth, and dc operating voltage



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Model 6350 Television Modulator

Specifications

Video

Input type
Baseband video, sync negative
Input level
0.5 V p-p min for 87.5% depth of modulation
Input impedance
75 Ω unbalanced (or high impedance loop-through, switch-selected)
Return loss
>30 dB
Frequency response
±0.5 dB, 10 Hz to 4.2 MHz
Differential gain
± 0.18 dB max at 87.5% modulation
Differential phase
±0.5° max at 87.5% modulation
Hum and noise
60 dB down with respect to 90% modulation
Tilt
1% max on 60 Hz, 50% square wave

Audio

Input level
Normally set for -10 dBm to +10 dBm
Internally switchable to two other ranges:
+5 dBm to +25 dBm
-25 dBm to -5 dBm
Input impedance
600 Ω balance. May be field modified for high impedance bridging input
Common mode hum rejection
40 dB
Frequency response
±0.5 dB, 30 Hz to 105 kHz*
(* For BTSC stereo input, internal jumpers must be positioned for stereo mode)
Carrier shift with modulation
±100 Hz or less
Harmonic distortion
0.5% max, 30 Hz to 15 kHz at 25 kHz deviation
FM hum and noise
60 dB down with respect to 25 kHz deviation
Intercarrier frequency tolerance
Within ±500 Hz of being 4.5 MHz above video carrier

4.5 MHz FM Input

Input level
10 mV to 200 mV rms
Input impedance
75 Ω unbalanced (normally supplied as composite picture and aural subcarrier input)

RF Output

Output frequency
Any standard VHF channel, sub-low, midband superband, hyperband and extended hyperband. Transposed video-sound channels available.
Incremental and harmonically related coherent outputs are available, as are nonstandard output frequencies
Output impedance
75 Ω unbalanced
VSWR
1.35:1
Output level
+40 dBmV to 60 dBmV continuously variable
Spurious outputs
60 dB below video carrier with video carrier at +60 dBmV and sound carrier at +45 dBmV
Frequency tolerance stability
VHF, midband: ±8 kHz
Superband: ±10 kHz
Hyperband: ±12 kHz
(Crystal controlled FCC channels ±5 kHz)
Group delay response
Meets FCC predistortion no. 73.687 requirements for color transmission
Vestigial sideband response
-20 dB at channel edge
-40 dB at adjacent picture and sound carrier frequencies and all frequencies farther removed from channel

Spectrum inversion (option SI)

Flatness: ±0.3 dB
IF output frequencies: video 42.25 MHz, audio 46.75 MHz
Frequency accuracy: ±5 kHz
Spurious outputs: 60 dB below video carrier with video IF carrier set at +42 dBmV and audio IF carrier set at +27 dBmV (this corresponds to +60 dBmV output level)

DIFL Levels

DIFL A
Video IF output level
+46 dBmV
Sound IF output level
+46 dBmV
DIFL B
Video IF output level
+43 dBmV
Sound IF output level
+38 dBmV

Phase Lock (option PL)

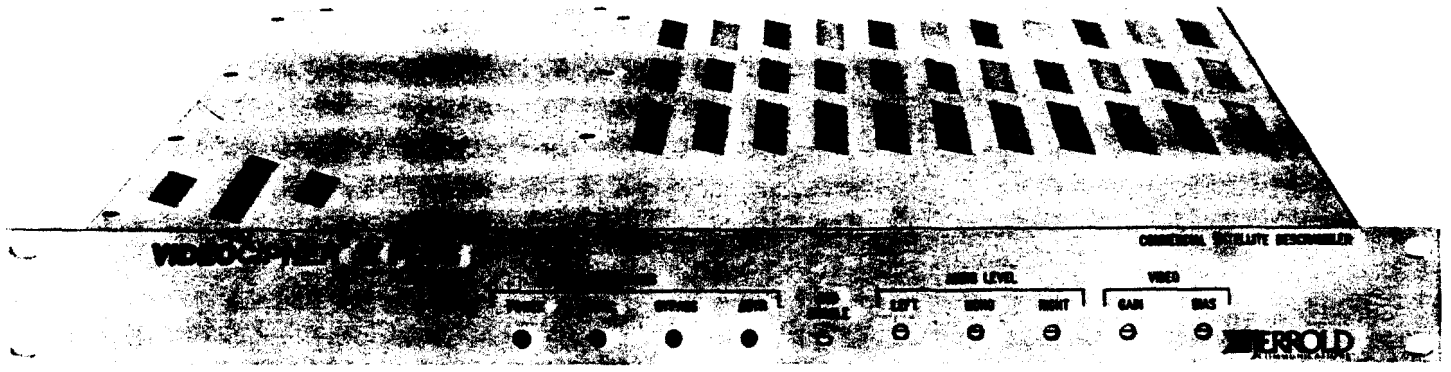
Reference input frequency
Available in same frequency selections as output video carrier (except sub-low)
Reference input level
-10 dBmV to +40 dBmV (except hyperband)
+2 dBmV to +60 dBmV (hyperband only)
Acquisition range
±25 kHz (±17 kHz hyperband)
Demodulated video output
1 V p-p nominal negative sync. Can be used for gen-locking to interfering modulation. Color burst included (not featured on hyperband)

Jerrold COMMANDER VCII-SD

#7150

Slimline →Descrambler

(DECODER)



FEATURES

- **1.75 INCH RACK HEIGHT**
- **ON-SCREEN DIAGNOSTIC CAPABILITY**
- **FRONT PANEL GAIN CONTROLS AND INDICATORS**
- **VIDEOCIPHER II PLUS AND RS ENHANCED SECURITY**

Jerrold's Commander VCII PLUS Slimline Descrambler offers satellite programmers the same enhanced security as the Video Cipher II Plus, but now is offered in a compact 1.75 inch rack-mounted housing.

VIDEOCIPHER II PLUS enhances signal security by combining the functions of four VCII integrated circuits into a single customized security chip making the descrambler technology less susceptible to piracy. VCII RS (Renewable Security) technology provides the capability for future security enhancement upgrades through the use of a smart card/TVPass card.

The On-Screen Display assists CATV operators during trouble shooting by providing the following: Scrambling Mode, Authorization Status, Authorization Tiers, and Program Frame Counts.

The VCII SD is a power efficient descrambler and offers low heat dissipation. It is compatible with most commercial satellite receivers which provide 1 Volt P-P output.

FRONT PANEL CONTROLS AND INDICATORS

The VCII SD offers convenient front panel controls for audio level and video gain and bias adjustments. A recessed OSD enable switch is also front panel accessible.

LED indicators are prominently displayed to provide quick visual status checks for VideoCipher sync and authorization. LED's also indicate power on and operation in the bypass mode.

EXHIBIT B

13

Specifications

VIDEO	
Frequency Response	+/– .5 dB, 10 KHz to 4.2 MHz
Differential Gain	<3%, 10% – 90% APL
Differential Phase	<3%, 10% – 90% APL
S/N Ratio (Weighted)	57 dB min
Signal Level Out	1V P-P, gain adjustable +/–3 dB
Impedance	75 Ohm unbalanced
AUDIO	
Frequency Response	+/– .5 dB max, 20 Hz to 15 KHz
S/N Ratio	75 dB min
Total Harmonic Distortion	.4% or better at 1 KHz
Output Impedance	600 Ohm, balanced
GENERAL	
Power Requirements	90-125 VAC, 60 Hz, 35 Watts max
Dimensions	19"W x 1.75"H x 11"D
Operating Temperature Range	32°F to 120°F (0°C to 50°C)

Specifications subject to change without notice.

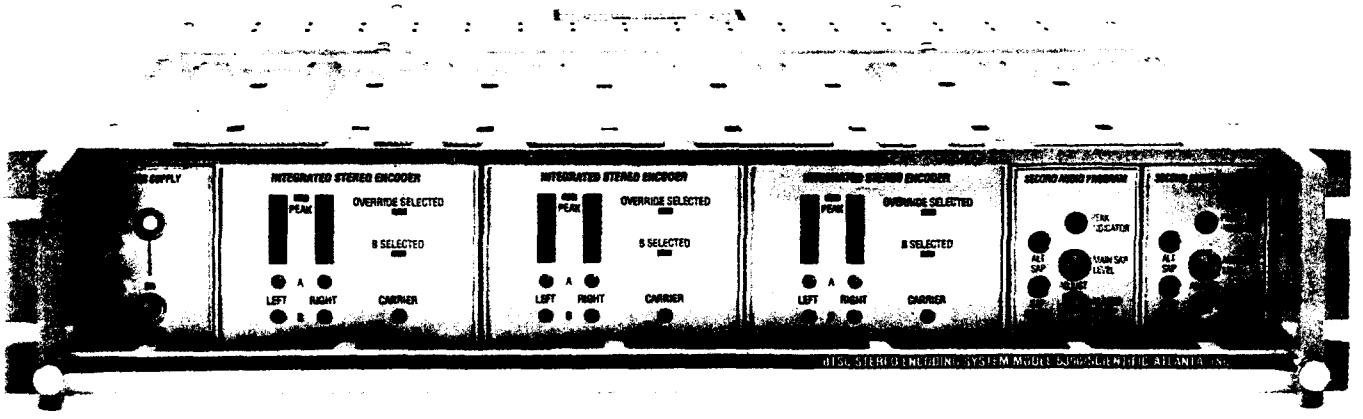
In U.S.: Hatboro, PA 19040 (215) 674-4800. In Canada: Toronto, Ont. (416) 789-7831. In Europe: Reading, England 44-734-755555. In Hong Kong: 852-587-1163. In Brazil: 55-21-494-3132. In Argentina: 541-788-4567.

Scientific Atlanta

Broadband Communications Group

$1200

BTSC Stereo Encoding System
Series 6390



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The Model 6390 BTSC Stereo Encoding System provides for convenient addition of several BTSC stereo channels using one headend rack space. This flexible package allows for combinations of stereo encoder modules and Secondary Audio Program modules to meet the audio requirements of every headend.*

Features

- Modular design provides slide-in convenience
- Space savings in headend
- Calibration tone for modulator setup
- Peak limiter maintains consistent levels
- Dual stereo input switching for alternate programming

Description

The Model 6390 BTSC Stereo Encoding System utilizes the same modular design of Scientific-Atlanta's traditional headend equipment. The 3.5 inch rack-mounted chassis provides for the addition of stereo encoders (one to four) and optional Second Audio Program (SAP) modules (one or two) by simply sliding in the appropriate units.

Each stereo channel in the Model 6390 BTSC Stereo Encoding System provides a BTSC stereo output at 41.25 MHz, 4.5 MHz, and baseband. These output selections insure headend compatibility with all television modulators. Convenient wiring arrangements allow an encoder to be "pulled" from the chassis without disconnecting any headend wiring.

Secondary audio services, such as bilingual programs, can easily be added to the Model 6390 BTSC Stereo Encoding System by inserting a SAP module. Since the signal from the SAP module is combined internally with the output of the encoder module, additional wiring connections are not required.

*Broadcast Television Systems Committee

BTSC Stereo Encoding System
Series 6390

Specifications

Audio Characteristics

Audio input level
  -10 dBm to +10 dBm
Audio input impedance
  >10 kΩ, balanced
Composite BTSC output level
  1 V p-p for ±25 kHz deviation
Composite BTSC output load impedance
  600 Ω or higher, balanced
Frequency response (with dbx®)
  Left or right channel
    ±0.5 dB (50 Hz to 14.5 kHz), -3 dB @ 15 kHz
Channel separation (with dbx)
  Typical separation
    >33 dB (50 Hz to 14 kHz)
Total harmonic distortion
  Main audio distortion
    <0.5%
  SAP channel
    <1% (10 kHz BW)
Test tone frequency
  10.4 kHz

Video Characteristics

Video input level (video loop-thru)
  1 V p-p, ±6 dB
Input return loss
  High Z loop-thru
    >20 dB, when terminated in 75 Ω
Horizontal sync lock range
  ±3 Hz

Power Requirements

Input voltage
  105 V ac to 130 V ac, 60 Hz
Input power
  35 W, typical
  60 W, max

Dimensions

3.5 in. H x 19 in. W x 17 in. D

Order Information

- Model 6390-X-XXX for BTSC Stereo Encoding Chassis with

If secondary audio program is required:
- **SP1** = one SAP module
- **SP2** = two SAP modules

- **1** = one stereo encoder module
- **2** = two stereo encoder modules
- **3** = three stereo encoder modules
- **4** = four stereo encoder modules

Note: When using SAP module(s), a maximum of three stereo encoder modules may be specified.

Specifications and product availability subject to change without notice.

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Our customers are the winners.
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fm Systems

ALM672 ✓ $600.

STEREO AUDIO LEVEL MASTER

The ALM672 AUDIO LEVEL MASTER stabilizes audio levels from unstable sources. Many audio program sources in a cable head-end are prone to change in level between programs, or in the case of ad insert equipment, from tape to tape. The volume of these program sources are often not under the control of the head-end technician, such as programs received over the satellites. In the past this has raised havoc with TV audio levels on cable systems.

Now, with the ALM672 to stabilize levels and the ADM-1 Audio Deviation Meter to set those levels accurately, the days of wildly varying audio level are gone.

The AUDIO LEVEL MASTER is a broadcaster quality, fully professional grade, automatic audio level control system, built with the price and quality conscious Cable Operator in mind. Each ALM672 card contains one full stereo audio service, and three stereo cards fit in one PMS610 mainframe. Since the PMS610 mainframe only occupies one rack space (1.75 inches), the Audio Level Master needs very little of the scarce rack space in the cable head-end.

Each stereo channel is dual-band, with low frequencies controlled independantly of the high frequencies. Very sophisticated timing and logarithmic control circuits insure a constant output volume, even though the signal input may vary throughout a 30 dB power range.

An L.E.D. display monitors the degree of compression being applied to the signal and assures the operator that the output volume is fully under control and delivering the required level.

The AUDIO LEVEL MASTER will give you trouble-free control of your audio levels and provide consistant TV audio volume, channel-to-channel and program-to-program.

Become the MASTER of your TV audio levels!

Stop audio volume trouble calls!

3877 South Main Street, Santa Ana, California 92707, Phone 714/979-3355

ALM672

STEREO AUDIO LEVEL MASTER

INPUT	SPECIFICATION
Average Program Level (APL)	-20 to +8 dBm (adj. range)
Peak Program Level (PPL)	10 dB above APL
Impedance	Balanced 600 Ohm
Common Mode Supression	40 dB or better
THROUGHPUT	
Frequency Response	40 Hz to 15 Khz, 0.5 dB
Compression Ratio	30 dB input range reduced to 1 dB output change
Compression Gating	No change in gain during input level drop-out
Distortion	0.25% maximum
Signal-To-Noise	75 dB
Compression Artifacts	None Perceptible
Compression System	Dual Band
OUTPUT	
Average Program Level (SET)	0, +4, or +8 dBm
Peak Program Level	10 dB above APL
Impedance	600 Ohm load, balanced & floating
METERING	
Compression Control	0 - 30 dB L.E.D. Indicator
MECHANICAL	
Stereo Card	Fits in one of three spaces in the 1.75" high PMS610 mainframe
Audio Connectors	Detachable Connector Screw Terminal